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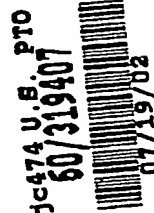
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VEHICLE MIRROR IMPROVEMENTS

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specification

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SPECIFICATION

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VEHICLE MIRROR IMPROVEMENTS

Background of Invention

Field of the Invention

[0001] The invention relates to external vehicle mirrors and, more particularly, to improvements related to reducing costs of manufacture.

Description of the Related Art

[0002] External mirrors are ubiquitous for contemporary vehicles and have long been used to aid the driver in operating the vehicle, especially in improving the rearward view of the driver. Most have a structure similar to that shown in prior art mirror illustrated in Figure 1. A vehicle mirror 10 comprises a mirror assembly 12 pivotally mounted to a support arm 14. The support arm 14 includes a base 16 carrying a post 18 with a central aperture 20. The mirror assembly 12 includes a mirror housing 22 having a pin 24 adapted to be received in the central aperture 20. The pin 24 is retained therein by a spring 26 and a push nut 28. Access to the foregoing is provided by a trap door 30.

[0003]

The mirror housing 22 is hollow and contains a power pack 32 which receives power by way of a wiring harness 34. A mirror case 36 is pivotally mounted to the power pack 32 at pivot point 38 for rotation about two axes. A heater 40, or in the absence of the heater, the support pad 42 can optionally be mounted to the mirror case 36. A mirror 44 is mounted to the mirror case, and the entire assembly of the power pack 32, mirror case 36, and mirror 44 is positioned inside the mirror housing 22. The working components of the mirror assembly inside the mirror housing 22 are accessible through an opening 46 in the mirror housing, which opening is normally

covered by a skull cap 48.

[0004] Problems Inherent with existing designs for external vehicle mirrors such as that illustrated in Figure 1 include the cost of materials, the time for manufacture and assembly, and the accuracy of fit and finish. There is a need for improvements to reduce costs, to minimize time for manufacture, to make assembly easier, and to streamline fit and finish.

Summary of Invention

[0005] The invention provides several improvements in the design of a vehicle mirror that result in less mass, less material costs, shorter manufacturing time, and easier assembly. Among the improvements is an improved mirror case that relocates the pivot point of the mirror closer to the outboard edge of the mirror housing. In addition, the power pack has been relocated closer to the inboard edge of the mirror housing. As a result, the size and shape of the mirror housing can be altered to result in less mass and less material.

[0006] In another aspect of the invention, the support arm incorporates an integral lip seal eliminating a need for a separate gasket when mounting the vehicle mirror to the vehicle. Another improvement in mounting the vehicle mirror is found in the mirror base plate where pockets are provided to help locate the mirror on the vehicle and eliminate mounting bolts.

[0007] In a further aspect of the invention, the skull cap is redesigned with a thinner wall to provide a spring fit to the mirror housing.

Brief Description of Drawings

[0008] Figure 1 is an exploded view of a vehicle mirror known in the prior art.

[0009] Figure 2 is a cross-sectional view of the mirror case according to the invention.

[0010] Figure 3 is a cross-sectional view of the mirror case of Figure 2 installed in an improved housing.

[0011] Figure 4 is an elevational view of the mirror case and housing of Figure 3 taken along line 4-4 of Figure 3.

- [0012] Figure 5 is a perspective view of a mirror base plate according to the invention.
- [0013] Figure 6 is a cross-sectional view of the mirror base plate of Figure 5 taken along line 6-6.
- [0014] Figure 7 is a perspective view of an improved mirror support arm according to the invention.
- [0015] Figure 8 is a schematic view of an improved location of the power pack in the mirror housing according to the invention.
- [0016] Figure 9 is a cross-sectional view of an improved skull cap according to the invention.

Detailed Description

- [0017] Figures 2 -4 illustrate a mirror case 50 according to the invention. The mirror case 50 is a molded polymer such as thermoplastic, formed into a cup shape comprising a rim 52 and an annular rib 54. A recess 56 within the annular rib 54 is roughly the desired shape of a mirror and has a flat, unobstructed base 58. The mirror surface 60 of the base 58 can be imprinted with a reflective coating in a known manner. Either transparent glass 62 or a mirror with its own reflective coating can be secured to the base within the recess. Tabs 64 molded into the annular rib 54 can retain the mirror 62 in the recess. It is preferable that the reverse side 68 of the base 58 also be unobstructed to enable room for more components in the mirror housing.
- [0018] A socket 70 extends outwardly from the rim 52 to provide a pivot point 72 near outside the edge of the mirror. It will be understood that the pivot point 72 can be located inwardly of the rim, but it is preferable for the pivot point to be as far away from the mirror support 14 as the design will permit, as shown in Figure 4.
- [0019] As a result of the location of the pivot point at the edge of the mirror case 50, Figure 3 shows a narrower housing that can be effected. Rotation of the mirror case 50 about a pivot point closer to the center means that both edges of the mirror case would rotate through an angle. Hence, both sides of the mirror housing must be deep enough to accommodate that rotation. Here, where the pivot point is located at one side of the housing, the housing can be narrower at that location.

[0020] Figures 5 and 6 illustrate an improved mirror base plate 80 comprising a series of depressions 82 projecting from the plate 80 on the vehicle side 84. Four pockets 86 formed by tabs extending outwardly from the mirror side 88 of the plate 80 help locate the mirror and hold it while the fixing bolt secures the mirror to the vehicle. In addition, provision of tabs on the mirror support arm will permit the mirror to be hooked on the pockets to hold it in place while further securement is provided. Alternatively, the "hooks" can be adapted to permanently secure the mirror support arm to the base plate, thereby providing means to attach the mirror to the vehicle without a fixing bolt.

[0021] Figure 7 shows a mirror support arm 100 having an integrally formed lip seal 102 around its peripheral edges 104. Such a lip seal will render a separate gasket unnecessary when installing the mirror to a vehicle.

[0022] Figure 8 shows an improved location for a power pack 110 in a mirror housing 112 having inboard 114 and outboard 116 sides. Preferably the power pack 110 is positioned in the housing inboard side 114 by clips 118. With the pivot point 72 located at the outboard side 116 of the housing 112, the power pack can impart motion to the mirror case 50 from the inboard side 114 so that it will rotate about the two axes remote from the pivot point. The inboard side 114 is typically the strongest area of the housing 112 and is where the most room is available for the power pack. Any access to the interior of the housing 112 can be provided by a skull cap 120 toward the outboard side 116.

[0023] Figure 9 illustrates an improved skull cap 120 comprising a thin molded wall 122, enabling it to bend. At the peripheral edges are tabs 124 that can engage the peripheral edge of an opening in the mirror housing to hold the skull cap over the opening by spring fit.

[0024] While the invention has been specifically described in connection with certain specific embodiments thereof, it is to be understood that this is by way of illustration and not of limitation, and the scope of the appended claims should be construed as broadly as the prior art will permit.

Claims

- [c1] In an external vehicle mirror assembly having a mirror housing with an inboard side and an outboard side, a mirror case holding a mirror within the housing, with the mirror case pivotably mounted to a power pack at a pivot point, the improvement wherein the pivot point is on the outboard side of the housing.

VEHICLE MIRROR IMPROVEMENTS

Abstract of Disclosure

The invention provides improvements to an external vehicle mirror assembly. The pivot point is located at an outboard side of the mirror housing. The power pack is mounted at an inboard side of the mirror housing. The mirror case is molded with no obstructions in a recessed base for holding the mirror and the pivotable socket is molded at one side of the mirror case.

Figures

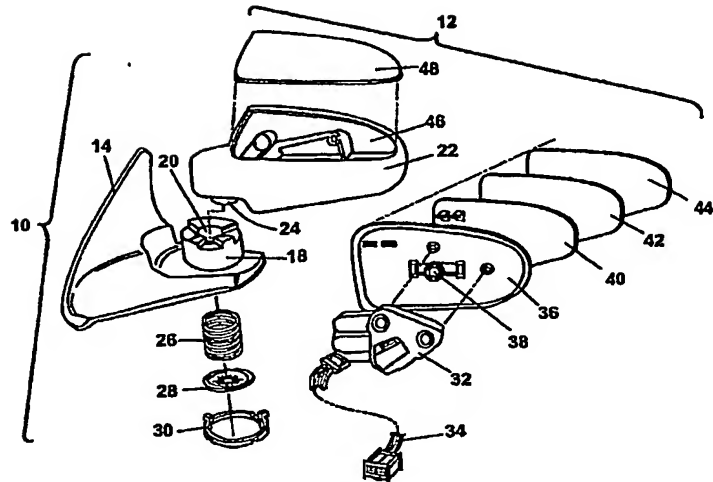


Fig. 1 (PRIOR ART)

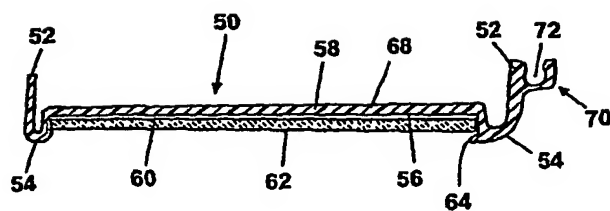


Fig. 2

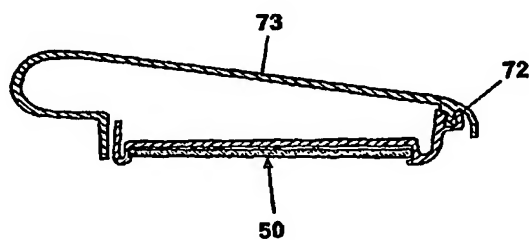


Fig. 3

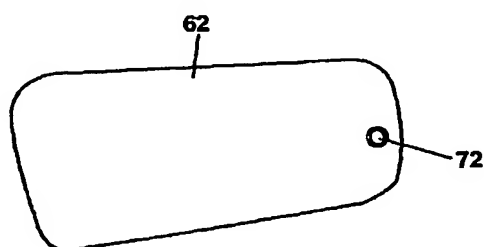


Fig. 4

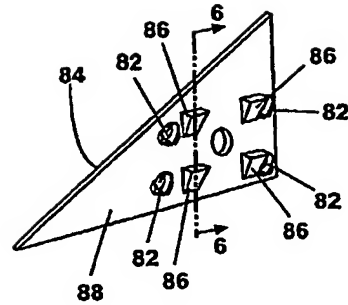


Fig. 5

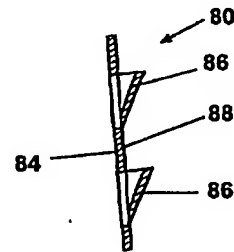


Fig. 6

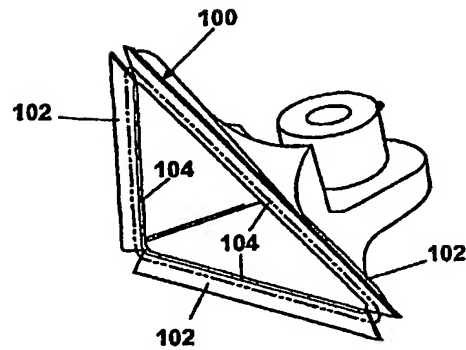


Fig. 7

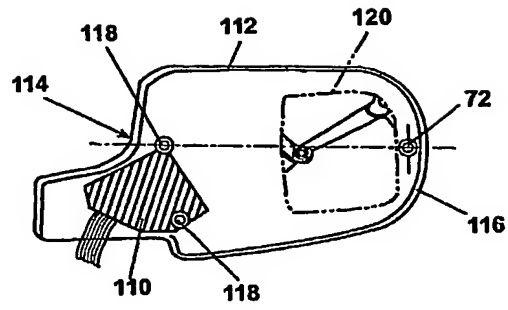


Fig. 8

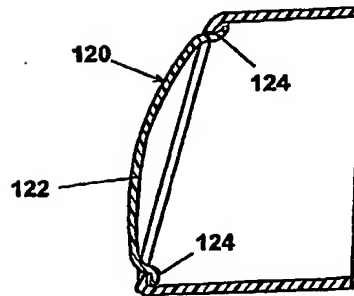


Fig. 9

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